systolic BP at peak exercise (mmHg)	≤ 159	160-179	180-199	≥ 200
number of patients (% of female)	112 (35%)	122 (35%)	115 (35%)	115 (35%)
ST/SP (%) in all patient	83/91	88/87	87/76	83/44
ST/SP (%) in female	82/90	92/92	88/53	90/26
ST/SP (%) in male	84/92	87/83	86/85	81/57

11:00 a.m.

884-3 Nitroglycerin Effect on Coronary Flow Reserve Measurements: Transthoracic Doppler Echocardiographic Study

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Background: In the current Doppler guide wire method, advance administration of nitroglycerin (NG) prior to the measurements of coronary flow velocity reserve (CFVR) has been recommended to avoid coronary diameter changes during vasodilator administration, because epicardial coronary diameter itself can affect coronary flow velocity. Recently, CFVR can be measured easily and noninvasively by transthoracic Doppler echocardiography (TTDE). We sought to examine whether advance sublingual administration of NG affects CFVR measurements NGNG and feasibility of using TTDE in the diagnosis of coronary stenosis.
Method: We studied 46 patients who underwent coronary angiography for the assessment of coronary artery disease. The study population consisted of 10 patients with significant left anterior descending artery (LAD) stenosis (group A) and 36 patients without significant LAD stenosis (group B). Firstly, without prior administration of NG, CFV in the distal LAD were recorded at rest and during hyperemia induced by intravenous ATP infusion (150μg/kg/min) to measure CFVR. Then, CFVR was also measured under the prior sublingual NG administration.
Results: The mean diastolic coronary flow velocities (MDV) at baseline were significantly lower with NG than those measured without NG (19.4±8.1cm/s vs 23.4±7.9cm/s, p<.01), while MDV at hyperemia did not differ regardless of using NG or not. Hence, CFVR was significantly higher under using NG compared with those without using NG (2.6±1.0 vs 2.3±0.8, p<.05). There were significant differences in MDV between groups A and B regardless of the administration of NG (NG (-); 1.3±0.3 versus 2.9±0.7; p<.0001, NG (+); 1.2±0.2 versus 2.6±0.7; p<.0001). With NG, a CFVR from MDV<2.0 had a sensitivity of 100% and a specificity of 94% for the presence of significant LAD stenosis. Without NG, a CFVR from MDV<2.0 had a sensitivity of 100% and a specificity of 89% for the presence of significant LAD stenosis.
Conclusion: With prior sublingual NG administration, noninvasive CFVR measurements by TTDE have much higher specificity in the diagnosis of significant LAD stenosis than those without NG administration.

11:15 a.m.

884-4 Development of a Clinical and Echocardiographic Score for Assigning Risk of Major Events After Exercise and Dobutamine Echocardiograms

Thomas H. Marwick, Colin Case, Charles Vasey, Stephen Sawada, University of Queensland, Brisbane, Australia

The prognostic value of exercise (ExE) and dobutamine echocardiograms (DbE) has been well defined in large studies. However, while risk is determined by both clinical and echo features, no simple means of combining these data has been defined. We sought to combine these data into risk scores.
Methods. At 3 expert centers, 7650 pts underwent standard ExE (n=5211) and DbE (n=2439) for evaluation of known or suspected CAD and were followed for up to 10 years (mean 5±2) for major events (death or myocardial infarction). A subgroup of 2953 ExE and 1025 DbE pts was randomly selected to develop separate multivariate models for prediction of events. After simplification of each model for clinical use, models were validated in the remaining ExE and DbE pts.
Results. The total number of events was 200 in the ExE and 225 in the DbE pts, of which 58 and 99 events occurred in the respective testing groups. The following regression equations gave equivalent results in the testing and validation groups for both ExE and DbE;
DbE = (Age*0.02) + (DM*1.0) + (Low RPP*0.6) + ([CHF+Ischemia+Scar]*0.7)
ExE = ([DM+CHF]*0.9) + 0.9(Ischemia #) + 1.5(Scar#) - (METS*0.19)
(where each categorical variable scored 1 when present and 0 when absent, Ischemia# = 1 for 1-2 VD, 6 for 3 VD; Scar# = 1 for 1-2 VD, 1.7 for 3 VD).
The table summarizes the scores and equivalent outcomes for ExE and DbE.
Conclusions. Risk scores based on clinical and ExE or DbE results may be used to quantify the risk of events during follow-up.

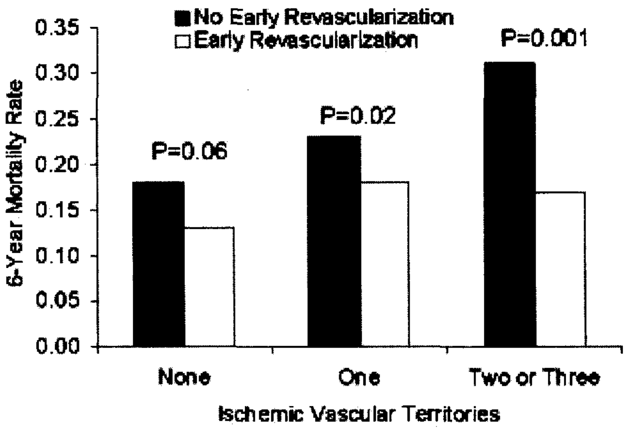
	Exercise		Dobutamine	
	Score	Outcome	Score	Outcome
Low risk	<-1.3	>98%	<1.5	>94%
Intermed risk	-1.3 to 0.8	83-98%	1.5-2.7	75-94%
High risk	>0.8	<83%	>2.7	<75%

11:30 a.m.

884-5 Survival Benefits of Early Myocardial Revascularization After Stress Echocardiography: A Propensity Analysis

Michael S. Lauer, Claire E. Pothier, Colin Case, Charles Vasey, Stephen Sawada, Thomas H. Marwick, The Cleveland Clinic Foundation, Cleveland, OH, University of Queensland, Brisbane, Australia

Background: Although myocardial revascularization is often performed to alleviate documented myocardial ischemia, the impact of this practice on survival has not been demonstrated in randomized trials. Standard observational analyses suffer from severe confounding and selection biases.
Methods: We used propensity analysis to determine whether revascularization following stress echocardiography (STE) improved survival among 7957 patients in 3 different institutions. During the first 3 months after STE, 317 (4%) underwent revascularization. We generated a propensity score using logistic modeling involving 13 demographic, clinical, and echocardiographic variables.
Results: Patients who underwent revascularization were older (64 vs. 61 years) and more likely to have ischemia (63% vs. 20%). We propensity matched these 317 patients with 317 patients who did not undergo revascularization with resulting similarities of age (64 vs 64 years) and equivalent rates of ischemia (63% vs 62%). During 5 years of follow-up, 75 patients (25%) who did not undergo revascularization died, whereas only 50 patients (16%) who did undergo revascularization died (propensity and covariate adjusted hazard ratio after 3 months 0.51, 95% CI 0.31-0.83, P=0.0073). Absolute benefits were primarily noted in patients with ischemia in ≥ 2 vascular territories (Figure).



Conclusion: Early myocardial revascularization is likely to lead to a survival benefit, especially among patients with inducible multivessel ischemia.

11:45 a.m.

884-6 Impact of Doppler Angle Correction to the Diagnostic Accuracy of Tissue Doppler Imaging During Dobutamine Stress Echocardiography

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Objective: Assessment of regional left ventricular (LV) function during dobutamine stress echo (DSE) is subjective. Tissue Doppler (TD) methods for quantification are more objective, but limited by the angle-dependence of Doppler.
Methods: To test the hypothesis that a new TD system with angle-correction can increase the accuracy of quantification of regional wall motion during DSE, we studied 15 pts with normal and 14 pts with abnormal DSE. TD data were analyzed with and without angle-correction (ApliQ, Toshiba, Corp). Segmental tissue velocity derived from TD images of parasternal long, short axis (mid and apical level), apical 4 and 2 chamber views were compared to consensus routine 2D reading and coronary angiography.
Results: Tissue velocity was underestimated in segments where the wall motion was less parallel to the ultrasound beam: lateral and septal segments in short axis views, mid-anterior and mid-lateral segments in apical views. In these regions, the diagnostic accuracy of the angle-corrected method was superior to that of the non-angle corrected method. The angle corrected TD method had a sensitivity (Sen) of 88%, specificity (Sps) of 82% and accuracy (Acc) of 83% for an optimal cut-off of 2 cm/s The non-angle corrected TD method had a sensitivity of 69%, specificity of 75% and accuracy of 73% for an optimal cut-off 1cm/s, *Figure*. Area under curve= AUC.